FlyBy Math™ Alignment
Essential Academic Learning Requirements
And Grade Level Expectations

EALR 1: The student understands and applies the concepts and procedures of mathematics.

Component 1.1: Understand and apply concepts and procedures from number sense.

NUMBER AND NUMERATION

GLE 1.1.4 Apply ratio, percent, and direct proportion in situations.

Evidences of Learning	***FlyBy Math*™ Activities**
▪ Solve problems involving ratio and proportion (e.g., similar figures, scale drawings, rates, …).	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

ESTIMATION

GLE 1.1.8 Apply estimation strategies to predict or determine the reasonableness of answers in situations involving computation on rational numbers in any form including whole number powers and square roots of square numbers.

Evidences of Learning	***FlyBy Math*™ Activities**
▪ Use estimation to predict or to verify the reasonableness of calculated results.	--Predict outcomes and explain results of mathematical models and experiments. --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

Component 1.2: Understand and apply concepts and procedures from measurement.

ATTRIBUTES, UNITS, AND SYSTEMS

GLE 1.2.2 Understand and apply derived units of measurement.

Evidences of Learning	***FlyBy Math*™ Activities**
▪ Explain the concept of a rate.	--Interpret the slope of a line in the context of a distance-rate-time problem.
▪ Use rate to determine a measured outcome.	--Use the distance-rate-time formula to predict and analyze aircraft conflicts.

Component 1.5: Understand and apply concepts and procedures from algebraic sense.	
PATTERNS, FUNCTIONS, AND OTHER RELATIONS	
GLE 1.5.1 Apply understanding of linear and non-linear relationships to analyze patterns, sequences, and situations.	
Evidences of Learning	***FlyBy Math™* Activities**
▪ Extend, represent, or create linear and non-linear patterns and sequences using tables and graphs.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
▪ Predict an outcome given a linear relationship (e.g., from a graph of profit projections, predict the profit).	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
GLE 1.5.2 Analyze a pattern, table, graph, or situation to develop a rule.	
Evidences of Learning	***FlyBy Math™* Activities**
▪ Explain the nature of changes in quantities in linear relationships using graphs, tables, or expressions.	--Interpret the slope of a line in the context of a distance-rate-time problem. --Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
SYMBOLS AND REPRESENTATIONS	
GLE 1.5.4 Apply understanding of concepts of algebra to represent situations involving single-variable relationships.	
Evidences of Learning	***FlyBy Math™* Activities**
▪ Represent variable quantities through expressions, linear equations, inequalities, tables, and graphs of situations.	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.
▪ Model a given description or situation involving relationships with a graph or table.	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
▪ Create a table or graph given a description of, or an expression for, a situation involving a linear or non-linear relationship.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
EVALUATING AND SOLVING	
GLE 1.5.5 Understand and apply the proceduresfor simplifying single-variable expressions.	
Evidences of Learning	***FlyBy Math™* Activities**
▪ Simplify expressions and evaluate formulas involving integers.	--Use the distance-rate-time formula to predict and analyze aircraft conflicts.

EALR 2: The student uses mathematics to define and solve problems.	
Component 2.1: Understand problems.	
GLE 2.1.1 Analyze a situation to define a problem.	
Evidences of Learning ▪ Define the problem.	***FlyBy Math™* Activities** --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
Component 2.2: Apply strategies to construct solutions.	
GLE 2.2.1 Apply strategies, concepts, and procedures to devise a plan to solve the problem.	
Evidences of Learning ▪ Select and apply appropriate mathematical tools for a situation.	***FlyBy Math™* Activities** --Conduct simulation and measurement for several aircraft conflict problems. --Use tables, graphs, and equations to solve aircraft conflict problems.
GLE 2.2.2 Apply mathematical tools to solve the problem.	
Evidences of Learning ▪ Implement the plan devised to solve the problem.	***FlyBy Math™* Activities** --Conduct simulation and measurement for several aircraft conflict problems. --Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
▪ Check the solution to see if it works.	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

EALR 3: The student uses mathematical reasoning.	
Component 3.2: Make predictions, inferences, conjectures, and draw conclusions.	
GLE 3.2.1 Apply prediction and inference skills to make or evaluate conjectures.	
Evidences of Learning	***FlyBy Math™* Activities** --Predict outcomes and explain results of mathematical models and experiments. --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

GLE 3.2.2 Apply the skills of drawing conclusions and support the conclusions using evidence.	
Evidences of Learning ▪ Draw conclusions from displays, texts, or oral discussions and justify those conclusions with logical reasoning or other evidence.	***FlyBy Math™* Activities** --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
Component 3.3: Verify results	
GLE 3.3.1 Analyze procedures and information used to justify results using evidence.	
Evidences of Learning ▪ Use estimation to predict or to verify the reasonableness of calculated results.	***FlyBy Math™* Activities** --Predict outcomes and explain results of mathematical models and experiments. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

EALR 4: The student communicates knowledge and understanding in both everyday and mathematical language.	
Component 4.1: Gather information.	
GLE 4.1.2 Synthesize information from multiple sources using reading, listening, and observation.	
Evidences of Learning ▪ Model the relationship with a table or graph given a description of, or an equation for, a situation involving an inequality or linear relationship.	***FlyBy Math™* Activities** --Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
Component 4.2: Organize, represent, and share information.	
GLE 4.2.2 Apply communication skills to clearly and effectively express or present ideas and situations using mathematical language or notation.	
Evidences of Learning ▪ Clearly explain, describe, or represent mathematical information in a pictorial, tabular, graphical, two- or three-dimensional drawing, or other form as appropriate for the mathematical information (e.g., time, distance, categories), audience, and/or purpose, such as to perform or persuade, with notation and labels as needed.	***FlyBy Math™* Activities** --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system. --Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

EALR 5: The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

Component 5.1: Relate concepts and procedures within mathematics.

GLE 5.1.1 Apply concepts and procedures from a variety of mathematical areas in a given problem or situation.

Evidences of Learning	***FlyBy Math™* Activities**
▪ Solve problems involving ratio and proportion (e.g., similar figures, scale drawings, rates…).	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

GLE 5.1.2 Apply different mathematical models and representations to the same situation.

Evidences of Learning	***FlyBy Math™* Activities**
▪ Match a situation with a data set or graph.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

Component 5.3: Relate mathematical concepts procedures to real-world situations.

GLE 5.3.1 Understand that mathematics is used in daily life and extensively outside the classroom.

Evidences of Learning	***FlyBy Math™* Activities**
▪ Use estimation to predict or to verify the reasonableness of calculated results.	--Predict outcomes and explain results of mathematical models and experiments. -Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

GLE 5.3.2 Understand that mathematics is used within many occupations or careers.

Evidences of Learning	***FlyBy Math™* Activities**
▪ Explain how mathematics is used in careers or occupations of interest (e.g., complete a mathematically based project).	--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.